Remarks/Arguments:

Applicant wishes to thank the Examiner for his detailed comments. As Examiner has grouped his actions by sections, Applicant will respond to these sections one by one.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1-2. Examiner has stated:

"A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 12, 2008 has been entered.

"The text of those sections of Title *35,* U.S. Code not included in this action can be found in a prior Office action."

No response is believed to be necessary.

Election/Restrictions

3. Examiner has stated:

"Claims 11, 12 and 14 continue to stand as being withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made without traverse in the reply filed on April 9, 2007."

No response is believed to be necessary.

Claim Rejections -35 USC§ 103

4. Examiner has stated:

"Claims 1, 2 and 4 through 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Mallary *5,103,553,* Cohen et al 5,141,623, and Aboaf et al 6,038,110. Mallary discloses a method for fabricating a write pole tip for perpendicular recording (col. I, lines 43-44) comprising: **fabricating a PI write pole (e.g. 12, in Fig. 1), coils (e.g. *25),* and a**

P2 flux shaping layer (e.g. 16, col. 3, lines 23-24); depositing a P3 layer (e.g. 14, col. 2, lines 63+) that also forms a P3 pole tip on the P2 flux shaping layer." (emphasis added- L.G.)

"Mallary does not teach that the P3 layer is patterned by depositing a CMP stop layer on the P3 layer, depositing at least one sacrificial layer on the CMP stop layer, shaping the P3 layer into the pole tip, and removing the at least one sacrificial layer to leave the P3 pole tip.

"It is well worth noting that the P3 layer of Mallary, including the P3 pole tip, is the top or upper magnetic pole.

"Cohen discloses a top pole patterning process that includes depositing a CMP stop layer (e.g. 29, 30) on a top pole layer (e.g. 24 in Fig. 31), depositing at least one sacrificial layer (e.g. 32) on the CN4P stop layer, shaping the top pole layer into a pole tip, and removing the at least one sacrificial layer to leave the pole tip (see sequence of Figs. 3G to 3J)."

Applicant respectfully asserts that there are a number of errors and misconceptions exhibited by the Examiner's statements.

First, it is assertedly obvious to anyone skilled in the art that when the terms "P1 pole", "P2 pole" and "P3 pole" are used, that a write head is being described, and more specifically a perpendicular write head. A read head has a much different structure, usually including a pinned magnetic layer and a free magnetic layer, and the difference in orientation between the pinned and free layers produces a difference in resistance, which translates in a difference in voltage that signals whether a "one" or a "zero" is being read. A read head does not include elements which are commonly referred to as a "P1 pole", "P2 pole" or "P3 pole".

In contrast, a write head has a lower magnetic pole, usually referred to as the "P1 pole" and an upper pole called a "P2 pole". Magnetic flux passes between these two poles and the nearby magnetic media to record the ones and zeros that make up the recorded data.

The term "P3 pole" is used in the art even more particularly in the art to refer to a portion of a perpendicular write head, as is discussed in the present application. One skilled in the art knows that longitudinal heads do not commonly use a "P3 pole", and further, one skilled in the art, as further informed by the teachings of the specification, would understand in a perpendicular head something about the structure of the head, i.e. that the P3 pole is used to concentrate the

magnetic flux for perpendicular writing operations, in a manner that a P2 pole of a longitudinal write head does not. Additionally, P2 poles in a longitudinal write head are not referred to as "P2 flux shaping layers". Perpendicular write heads use a P2 flux shaping layer to concentrate the flux into the connected P3 pole.

In the passage quoted above, Examiner is apparently using the terms of art "P1 pole", "P2 pole" and "P3 pole" at random to refer to any structure in the vicinity, whether it is part of a write head or not. In *Mallory*, what Examiner refers to as a "P2 flux shaping layer (e.g. 16, col. 3, lines 23-24)" is actually "read pole **16**" (col. 2, line 28). Col. 3, lines 23-24 of *Mallory* actually state: "During readback the read pole **16** conducts flow from the media to the attached flux sensor." The read head **16** is in no sense a "P2 flux shaping layer" as that term is used by those skilled in the art. Moreover, it is not part of the write head at all.

It was thought that this standard usage of terms would be obvious to someone familiar with the subject. However, apparently more explicit recitation is required in order to erase any confusion that the P1, P2 and P3 layers referred to are explicitly part of a write head.

Thus Claim 1 has been currently amended to recite:

"1. A method for fabricating a write pole tip for perpendicular recording, comprising:
- A) fabricating a P1 write pole, coils and a P2 write pole flux shaping layer;
- B) depositing a P3 write pole layer on said P2 write pole flux shaping layer;
- C) depositing a CMP stop layer on said P3 write pole layer;
- D) depositing at least one sacrificial layer on said CMP stop layer;
- E) shaping said P3 write pole layer into P3 write pole tip;
- F) removing said at least one sacrificial layer to leave said P3 write pole tip; and
- G) encapsulating said P3 write pole tip in a protective layer."

Thus it is hoped, even if the terms of art "P1" "P2" and "P3" are not familiar as denoting parts of a write head, that it is clear that Claim 1, as amended, claims the method of fabricating a write head, using elements of a write head, of which a read head is not a part.

Thus it is respectfully urged that Examiner withdraw his rejection of Claim 1, and allow this claim.

Examiner has further stated:

"Regarding Claim(s) 2, Cohen further teaches within the process that the top pole layer material isNiFe (col. 5, lines 30-3 1)."

Claim 2 is dependent upon independent Claim 1, and inherits by its dependence the assertedly novel and non-obvious subject matter of Claim 1.

Therefore, Applicant respectfully requests that the rejections as to this claim be withdrawn and Claim 2 be allowed.

Examiner has further stated:

"Regarding Claim(s) 4 through 6, Cohen further teaches that the sacrificial layer is NiFe (col. 5, lines *60-65)* and also includes a seed layer (e.g. 27). The sacrificial layer is created by forming a cavity surrounded by photo-resist material (e.g. 29) where the sacrificial material fills or is deposited in the cavity."

Claims 4-6 are dependent upon independent Claim 1, and inherit by their dependence the assertedly novel and non-obvious subject matter of Claim 1.

Therefore, Applicant respectfully requests that the rejections as to these claims be withdrawn and Claims 4-6 be allowed.

Examiner has further stated:

"Regarding Claim(s) 7 through 9, Cohen further teaches shaping of the top pole layer is done by ion milling where the sacrificial layer is a mask and the CMP stop layer is a secondary mask. The ion milling is used to bevel sides of the top pole tip and is beveled at an angle of 15~ (see Figs. 3F to 31, and the Tilt angle at Table in col. *6).*

"The benefits of the overall pole patterning process of Cohen allows better pole alignment between upper and lower poles with increased data storage densities (col. 3, lines 3-5) and provides a CMP stop layer and sacrificial layer that is more controllable and readily removable (col. 2, lines 66-68).

"It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Mallary by utilizing the top pole patterning process of Cohen to pattern the P3 layer of Mallary, in order to provide the benefits of better pole alignment with increased data storage densities and a patterning technique that is more controllable and readily removable.

"Aboaf shows that it is well known in the art to encapsulate the top or upper magnetic pole, along with the upper magnetic pole tip, with a protective layer (e.g. 42, Fig. 2) to simply protect and cover the upper magnetic pole.

"It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Mallary by adding the well known step of encapsulating the P3 pole tip (i.e. upper magnetic pole and pole tip) with a protective layer, as taught by Aboaf, to protect and cover the write pole, P3 layer, and P3 pole tip."

Claims 7-9 are dependent upon independent Claim 1, and inherit by their dependence the assertedly novel and non-obvious subject matter of Claim 1.

Therefore, Applicant respectfully requests that the rejections as to these claims be withdrawn and Claims 7-9 be allowed.

5. Examiner has further stated:

"Claims 3 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Mallary et al, Cohen et al, and Aboaf et al, as applied to Claim I above, and further in view of Tran et al 5,853,900.

"Mallary, as modified by Cohen and Aboaf, discloses a manufacturing method as relied upon above. The modified Mallary method does not teach that the CMP stop layer is made of $A1_20_3$, i.e. aluminum oxide, and that the CMP stop layer matches the material of the encapsulating material.

"It is noted that the encapsulating material of Aboaf is an insulating material and one of the materials of the CMP stop layer material of Cohen is a photoresist.

"Tran shows that it is known to utilize aluminum oxide as a photoresist material (col. 7, lines 6-14) and that aluminum oxide is a well known and conventional insulating material.

"It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the processes of Mallary, Cohen and Aboaf, by utilizing aluminum oxide (Al_20_3) as the material for both the CMP stop layer and the encapsulating material to provide the necessary patterning material in shaping of the P3 layer and to insulate the P3 layer."

Claims 3 and 13 are dependent upon independent Claim 1, and inherit by their dependence the assertedly novel and non-obvious subject matter of Claim 1.

Therefore, Applicant respectfully requests that the rejections as to these claims be withdrawn and Claims 3 and 13 be allowed.

6. Examiner has further stated:

"Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over he combination of Mallary et al, Cohen et al, and Aboaf et al, as applied to Claim 1 above, and further in view of Ohtsu et al 200400520009.

"Mallary, as modified by Cohen and Aboaf, discloses a manufacturing method as relied upon above. The modified Mallary method does not teach that the finished pole tip has a width less than 200 nm.

"Ohtsu shows that a finished pole tip can be at 200 nm or less (paragraph [0049]) to improve the bias state.

"It would have obvious to one of ordinary skill in the art at the time the invention was made to have modified the P3 pole tip of Mallary by shaping it to a 200 nm width or less, as taught by Ohtsu, to provide a narrow track width for improving the bias state."

Claim 10 is dependent upon independent Claim 1, and inherits by its dependence the assertedly novel and non-obvious subject matter of Claim 1.

Therefore, Applicant respectfully requests that the rejection as to this claim be withdrawn and Claim 10 be allowed.

Thus Applicant respectfully asserts that remaining Claims 1-10, and 13 are allowable over the cited prior art and requests that the rejections as to Claims 1-10, and 13 be withdrawn and these claims be allowed.

Further, as Claim 1 is assertedly an allowable generic or linking claim, it is requested that Claims 11, 12 and 14 be re-entered and allowed so that all Claims 1-14 be allowed.

Response to Arguments

7. Examiner has further stated:

"Applicant's arguments with respect to Claims 1 through 10 and 13 have been considered but are moot in view of the new ground(s) of rejection.

"NOTE: If the applicant(s) were to recite at the end of Claim 1, something to the effect of: --wherein the step of removing the at least one sacrificial layer is performed by chemical-mechanical polishing---, this would appear to define over the art of record. The applicant(s)have support for this feature in their specification, page 10, lines ***4-5.*** However, the applicant(s) have not claimed this feature."

Applicant wishes to thank Examiner for his suggestion. However, it is thought that the current amendments overcome the rejections, and the suggested limitation is unnecessary.

It is noted that the suggested additional limitation of "wherein the step of removing the at least one sacrificial layer is performed by chemical-mechanical polishing" was originally included in Claim 12, which is currently withdrawn. This is due to the Restriction Requirement that demanded that it be withdrawn as presenting too great a burden on the Examiner to search for.

Conclusion:

Applicant has endeavored to put this case into complete condition for allowance. It is thought that the §103 rejections were unfounded on the cited references or have been overcome by the present amendments. Applicant therefore respectfully asks that the rejections be withdrawn and that allowance of all claims presently in the case now be granted.

If the Examiner would like to discuss any of the points involved in the Response, he is urged to contact Applicant's Attorney at the numbers included below.

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